

WHAT IS CLAIMED IS:

1. An optoelectronic device, comprising:

2 an optical substrate coupled to a submount and including an
3 optical device; and

4 a signal and a ground conductor coupled to said submount,
5 wherein said signal and ground conductors have a direction of
6 signal propagation associated therewith, and wherein related
7 transitions of said signal and ground conductors between said
8 submount and said optical substrate are separated along said
9 direction by a predetermined distance.

2. The optoelectronic device as recited in Claim 1 wherein
2 said related transitions are transitions of said signal and ground
3 conductors from said submount to said optical substrate.

3. The optoelectronic device as recited in Claim 1 wherein
2 said predetermined distance is between about 10% and about 100% of
3 a radian of phase of a shortest wavelength (WLmin) of a signal that
4 propagates along said signal and ground conductors.

4. The optoelectronic device as recited in Claim 1 wherein
2 said optical device includes an optical waveguide having a

3 modulation region, and wherein one of said transitions is adjacent
4 said modulation region.

5. The optoelectronic device as recited in Claim 1 wherein
2 said related transitions are first transitions, and further
3 including second related transitions of said signal and ground
4 conductors between said submount and said optical substrate,
5 wherein said second transitions are separated along said direction.

6. The optoelectronic device as recited in Claim 1 wherein
2 said optical device is a modulator.

7. The optoelectronic device as recited in Claim 1 further
2 including a coplanar waveguide and a load resistor, said coplanar
3 waveguide located on said submount and including a signal trace and
4 a ground trace respectively contacting said signal and ground
5 conductors, said load resistor coupled to said signal conductor at
6 an end opposite from said signal trace, wherein a distance ($d_1 +$
7 d_2) between said signal trace and said load resistor is less than
8 or equal to the shortest wavelength (WL_{min}) that propagates along
9 said signal and ground conductors.

8. The optoelectronic device as recited in Claim 1 wherein
2 said predetermined distance defines a region that is at least a
3 portion of an inductive element.

9. The optoelectronic device as recited in Claim 1 wherein
2 said submount and said optical substrate are separated by a gap
3 ranging between about 1 μm and about 30 μm , wherein a material
4 having a dielectric constant less than about 4.0 occupies said gap.

10. The optoelectronic device as recited in Claim 1 wherein
2 said optoelectronic device is included within an optical
3 communications system including a transmitter or a receiver.

11. A transmission line, comprising:

2 a modulating device located on an optical substrate and
3 including a plurality of interconnecting transmission line segments
4 located on or in said optical substrate and each having an inherent
5 inductance that provide a predetermined characteristic impedance of
6 said transmission line when combined with a capacitance of said
7 modulating device.

12. The transmission line as recited in Claim 11 wherein said

2 modulating device is an electro-absorption modulator.

13. The transmission line as recited in Claim 11 wherein said

2 transmission line segments include signal and ground conductors
3 having a direction of signal propagation associated therewith, each
4 of said signal and ground conductors having related transitions
5 between said optical substrate and said modulating device, said
6 related transitions being separated along said direction by a
7 predetermined distance.

14. The transmission line as recited in Claim 13 wherein said

2 predetermined distance is between about 10% and about 100% of a
3 radian of phase of a shortest wavelength (WLmin) of a signal that
4 propagates along said transmission line.

15. The transmission line as recited in Claim 13 wherein said
2 modulating device includes an optical waveguide having a modulation
3 region, and wherein one of said transitions is adjacent said
4 modulation region.

16. The transmission line as recited in Claim 13 wherein said
2 predetermined distance defines a region that is at least a portion
3 of an inductive element.

17. The transmission line as recited in Claim 11 wherein said
2 transmission line is included within an optical communications
3 system including a transmitter or a receiver.

18. An optical communications system, comprising:

2 a transmission line including a modulating device having an
3 optical waveguide and located on an optical substrate, said
4 modulating device including a plurality of interconnecting
5 transmission line segments located on or in said optical substrate
6 and each having an inherent inductance that provides a
7 predetermined characteristic impedance of said transmission line
8 when combined with a capacitance of said modulating device; and
9 a laser optically coupled to said optical waveguide.

19. The optical communications system recited in Claim 18

2 wherein said transmission line segments include signal and ground
3 conductors having a direction of signal propagation associated
4 therewith, each of said signal and ground conductors having related
5 transitions between said optical substrate and said modulating
6 device, said related transitions being separated along said
7 direction by a predetermined distance.

20. The optical communications system recited in Claim 19

2 wherein optical waveguide includes a modulation region, and wherein
3 one of said transitions is adjacent said modulation region.